

The New Frontier in ISE Research: Online Affinity Spaces

QUESTIONS FOR FUTURE RESEARCH

The discussions in the workshop were organized around five themes, revealed in a survey of the related research literature. In addition to questions in these areas, there was a consensus that an inventory of informal science learning sites is needed, as a foundation for future research.

Theme 1. Equity and Diversity

How do we attract underrepresented groups (including women and members of different ethno-cultural and racial groups) to science learning and science careers? What role can affinity spaces play?

Theme 2. Interest

What draws people to participate in science-themed affinity spaces and what sustains their interest and continuing participation? What sustains their involvement over time? How do interests evolve in affinity spaces? What role does “transgressive” online behavior play in engagement?

Theme 3. Identity

What contributions can science affinity spaces make to the science identity of users, specifically youth? How would such findings impact the design of new affinity spaces? In online spaces focused on science, how do people identify with the groups and activities in which they participate?

Theme 4. Literacy

Which resources and literacies enable individuals to participate in informal science learning in online spaces? How can offline and online informal science affinity spaces be connected to each other and to real-world science learning environments, and how can such linked affinity environments contribute to science literacy?

Theme 5. Methodology

Which methodological approaches are appropriate to studying and understanding different types of participation and learning in online affinity spaces? What are the relative merits of ethnographic studies, design-based approaches, qualitative and quantitative approaches?

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Affinity Spaces for Informal Science Learning: Developing a Research Agenda Highlights of Workshop held July 6 & 7 at Games + Learning + Society, 2015

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Co-PI: Carlton Reeve, Senior Lecturer, University of Bradford & CEO: Play With Learning, Inc.

With the dramatic increase in the use of online social media today, there is a pressing need to develop a research agenda that explores informal science learning in these spaces. Over the past decade, numerous research agendas have been developed by the informal science education community for settings such as museums or maker spaces, yet there is no comparable agenda for online informal science learning.

COMMON FEATURES OF AFFINITY SPACES (based on Gee, 2004)

1. Common endeavor is primary, independent of race, class, age, gender, or disability, is primary.
2. Newbies and masters share common space.
3. Participants often create new content, works, projects.
4. Content organization is transformed by user interactions.
5. Both intensive and extensive knowledge are encouraged.
6. Both individual and distributed knowledge are encouraged.
7. Dispersed knowledge is encouraged.
8. Tacit knowledge is encouraged and honored.
9. There are many different forms and routes to participation.
10. There are many different routes to status.
11. Leadership is porous and leaders are resources.

SELECTED CROSS-CUTTING THEMES AND RESEARCH EXAMPLES

Social Media

The Pew Internet and American Life Project (<http://www.pewinternet.org>) has documented the dramatic growth of social media use in recent years. Social capital is a useful measure of the impact of social media. Cliff Lampe, with Nicole Ellison and Charles Steinfield examined the development of social capital on Facebook in 2007. An underlying question in social media research is the degree to which the design and/or uses of social media are reconfiguring core dimensions of communication – identity, trust, publicity, accountability, authenticity, privacy, intimacy, participation, equality, and more – in addition to learning (Livingstone, 2015).

Participatory Culture and Connected Learning

Digital media, participatory culture and real-world learning combine in “connected learning,” a phenomenon explored extensively by researchers in the Digital Media + Learning Hub, at <http://dmlhub.net>. This organization's 2013 report, *Connected Learning, an Agenda for Research and Design* by Mimi Ito and colleagues, presents a broad and compelling synthesis of research into connected learning and its capacity to leverage the power of modern digital media to “address the gap between in-school and out-of-school learning, intergenerational disconnects, and new equity gaps arising from the privatization of learning.”

June Ahn and his colleagues in the College of Information Studies at the University of Maryland are part of a design-based research initiative to explore connected learning and science education. They have followed students in an afterschool program for three years, documenting and correlating the behaviors of students with growth in learning and science identity. (Ahn et al, 2014).

Identity

In contrast to the sparse body of research into identity and science learning in online environments, identity has been extensively explored in the context of games and related affinity spaces. A model study examined how participation in the online affinity spaces surrounding the popular game *World of Warcraft* fosters the development of scientific habits of mind, including research, sharing hypotheses, proposing models, gathering data across multiple trials, and debating results (Steinkuehler & Duncan, 2008).

Kurt Squire, Ben Devane and colleagues explored identity development in the games *Grand Theft Auto* and *Civilization* and in the affinity spaces surrounding these games. In a later study, DeVane explores how his subjects in affinity spaces take on certain behaviors, belief systems, and forms of self-expression, demonstrating how identity is intimately linked to how participants learn in such spaces (Devane, 2014).

Children Online

With more and younger users engaging in online activities, the issue of online safety has become a prominent theme of research. A significant body of European research, much of it focused on issues of online safety, is collected by EU Kids Online, a multi-national research network that seeks to better understand the role of the internet in children's lives. Deborah Fields and Sara Grimes are currently conducting a 3-year analysis of sites that encourage the creation and sharing of media by children. Their preliminary review documents the features of over 100 different sites in this category (Grimes & Fields, 2015).

WORKSHOP ATTENDEES

STEM Learning

Flávio Azevedo, University of Texas Austin
Leema Berland, University of Wisconsin-Madison
Tilly Blyth, National Museum of Science & Industry
Kelly Borden, Zooniverse, Chicago
Marie Domingo, Twin Cities Public TV
Noah Feinstein, University of Wisconsin-Madison
Martin Storksdieck, Oregon State University

Digital Media & Learning

June Ahn, University of Maryland, College Park
Douglas Clark, Vanderbilt University
Deborah Fields, University of Utah
Alex Halavais, Arizona State University
Sonia Livingstone, London School of Economics and Political Science

Affinity Spaces & Social Media

Nathan Allen, Reddit Science
Ben DeVane, University of Iowa
James Gee, Arizona State University
Jayne Lammers, University of Rochester
Cliff Lampe, University of Michigan
Darren McRoy, Zooniverse, Chicago

With support from the National Science Foundation's Science Learning+ initiative, Twin Cities Public Television, in St. Paul, MN, in collaboration with a team of researchers in the US and the UK, organized a workshop titled: Affinity Spaces for Informal Science Learning: Developing a Research Agenda. The workshop took place on July 6th and 7th, 2015, ahead of the Games + Learning + Society conference in Madison, Wisconsin.

GOAL

To develop and refine a set of concepts and issues to guide investigations into how participation in online affinity spaces can promote and enable informal science learning.

WHAT'S AN AFFINITY SPACE?

Generally, an affinity space is a place – virtual or physical – where informal learning takes place, where people are drawn together because of a shared interest or engagement in a common activity (Gee, 2004). Many affinity spaces form around science hobbies, such as astronomy, birding, making, gardening, and beekeeping. Examples include sites on:

- General science: Reddit's subreddit [reddit.com/r/science](https://www.reddit.com/r/science/);
- Scratch: wiki.scratch.mit.edu/wiki/Scratch_Community
- Q&A sites: StackExchange, www.stackexchange.com
- Citizen science: Zooniverse at zooniverse.org and Eyewire eyewire.org
- Climate change: realclimate.org/ and climate-debate.com.
- Museums: Science Buzz at the Science Museum of Minnesota, www.sciencebuzz.org

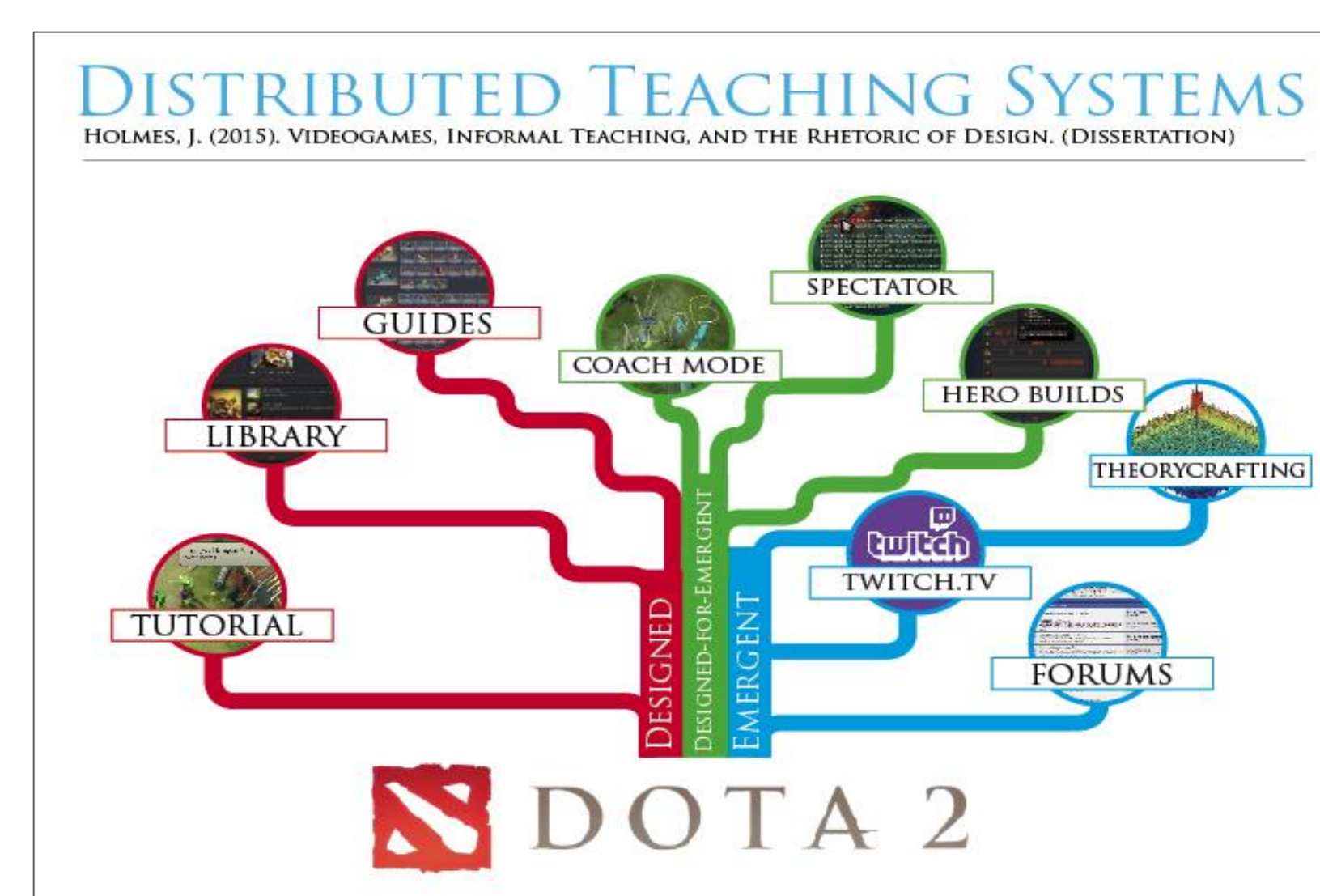
These examples illustrate the striking capacity of affinity spaces to connect millions of learners, especially those underserved populations who may have limited access to conventional sources of informal science learning.

AFFINITY SPACES AND LEARNING

“Young people today are confronted with and enter more and more affinity spaces. They see a different and arguably powerful vision of learning, affiliation, and identity when they do so. Learning becomes both a personal and unique trajectory through a complex space of opportunities...”

What these young people see in school may pale by comparison. It may seem to lack the imagination that infuses the non-school aspects of their lives. At the very least, they may demand an argument for “Why school?” (Gee, 2004, p. 89).

Affinity spaces are increasingly linked to other affinity spaces, as in the spaces linked to the game Dota 2, illustrated below:



Graphic courtesy of Jeffrey B. Holmes, Arizona State University.

As spaces of spaces, affinity spaces are rich distributed teaching and learning systems.